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DOMESTIC UTILIZATION OF COTTON IN RELATION TO ECONOMIC CONDITIONS IN THE SOUTH

U.S. Department of Agriculture

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The headlines of our papers are filled these days with the latest developments of the war in Europe. Some of us get pretty excited about what might happen to us should this or that side win the war. And yet the things that are happening daily in the field of cotton utilization in this country are vastly more important to the South, and possibly to our entire nation, than any probable outcome of this European war. It is not my intention to play down the effects of widespread foreign wars upon our own domestic life, for the effects are often severe, but rather to emphasize the close relationship which exists between the utilization of cotton in this country and economic conditions in the South.

Speaking of war, cotton itself is on a kind of battle front of its own. The quantities of cotton going into the hundreds of different domestic uses are constantly changing, as are the uses themselves. Changes in fashions and styles of clothing and the technical developments within industry contribute largely to this shifting. New uses appear from time to time increasing the demand for certain grades and staples of cotton, while consumption through some existing use is being curtailed or even completely stopped. Up to about 1930, cotton consumption in the United States was in a generally expansive period, so that decreased consumption in some channels was at least offset by increased consumption in others. For example, the decreased use of cotton in women's hosiery that occurred from 1920 to 1930 was more than offset by the large increase that occurred in the consumption of cotton in automobile tires. But whereas many of these changes prior to 1930 represented merely a shifting from one type of cotton product to another, especially in the field of clothing and household uses, in recent years, an increasing number of these changes have been caused by the direct substitution of other textiles and other materials for cotton products. Jute and paper mainly in industrial uses, and rayon mainly in clothing and household uses, have made measurable inroads on the consumption of cotton.

As an example of this substitution in industrial uses, consider the utilization of cotton in the cement industry. For the 25 years ending with 1925, nearly 90 percent of total cement shipments were made in cotton bags, but since 1930 less than 40 percent of the shipments were in cotton bags, while more than 40 percent were in paper bags, and the remainder shipped in bulk. The development of a paper material suitable for this purpose was an outstanding technological accomplishment, but the cotton grower can derive little satisfaction from knowing this. But perhaps it does bring to mind the question: Cannot technological research be applied in the same way to the advantage of cotton?

It can, and in a moment I'll give you a concrete example. But right now, let's take stock of what has been happening to cotton in other uses; that is, in clothing and household uses.

Statistics illustrating the displacement of cotton in the clothing and household fields are difficult to obtain, and those that are available are subject to a variety of conflicting interpretations. But I think we can obtain an answer from personal knowledge. How many articles that you now buy are made from synthetic fibers, whereas 10 or 12 years ago they were made mostly or wholly from cotton? For instance, men's socks, bedspreads, window curtains, ladies underwear, slips, and certain types of dresses. Multiplying your own experience by the total number of consumers in the United States, you can see there is no doubt that cotton has lost considerable of its market in many clothing and household uses.

At this point let me make two things very clear. First, I am not trying to condemn these fibers and other materials which compete with cotton. Blind antagonism toward them will not alter the situation. The very fact that we buy these competing products with our own money is evidence enough that we ourselves prefer them for certain uses, and freedom to spend what money we may have in the way that we please is something that none of us will willingly give up. And second, I am not trying to spread alarm. By far the bulk of cotton uses appear to be in no danger at all for many years to come from competing products. But don't let this lull us into a false sense of security. There are many small uses, and some not so small, which have already been lost, and there are many others which are in <u>danger</u> of being lost. Although individually these uses may be comparatively small, in the aggregate they assume considerable importance, and it is worth our every effort not only to <u>maintain</u> but also to <u>extend</u> the use of cotton.

I need not tell <u>this</u> audience why we should bend our efforts in this direction. You know why as well as I. Cotton, directly and indirectly, provides a livelihood to more people than does any other plant crop. About 12,000,000 people in the United States derive their principal support from the growing, ginning, handling, and manufacturing of cotton. It is the major crop on 1,500,000 farms, and of all the plant crops it is the greatest source of cash farm income. And in its manufacture, approximately 400,000 people are ordinarily employed in the 1,200 cotton textile mills of this country, by far the most of which are located in the South.

These are important facts - highly important - but they portray only a part of the picture I want to bring to you. Cotton is grown, picked, ginned, sold,and manufactured because there is a demand for the manufactured goods into which cotton goes. Cotton is not used simply because it has been grown, as witness our 14,000,000 bale carryover from the last crop-year. If we want to sell however much cotton is produced, at favorable prices, there must be a demand for an equivalent quantity of manufactured cotton goods at prices which permit manufacturers to pay favorable prices for the raw material. Of course there can be considerable fluctuation in the price of raw cotton without appreciably affecting the price of many types of finished cotton articles, such as men's shirts, where the price of the raw cotton is only a very small proportion of the selling price of the finished article. On the other hand, there are

many large uses, such as bags, where the price of the raw cotton represents nearly half the price of the finished bags, and where a difference of a few cents may mean a difference in sales of several million bags. In other words, whether we have good prices or poor prices, whether we can sell large crops or only small crops, is dependent in the final analysis upon conditions obtaining in the field of cotton utilization. Some of you may say that this is obvious. I think it is, but in the presence of other considerations it is a truth sometimes lost sight of and I want to emphasize it.

In what follows I want to confine my discussions to the utilization of cotton in domestic markets. During recent years our exports of cotton have fallen off sharply. That, in itself, is of tremendous importance to cotton growers but I do not want to get into a discussion of this problem. If we could regain our former volume of cotton exports with some degree of permanence, and at favorable prices, much of what I have to say would be of only academic interest. You have already heard our cotton export problem discussed on numerous occasions and there is nothing new which I can add. But I do want to point out that, owing largely to increased production of foreign growths and to the domestic policies of totalitarian countries encouraging the use of synthetic fibers, there is little likelihood that such large foreign markets as this country was accustomed to during the 1920's will ever be regained. As a consequence, the domestic market has become of increasing importance to cotton growers of the United States, and if production is to be maintained at anywhere near the levels of the 1920's, or even at the levels which obtained during the past 5 or 6 years, increased outlets must be found in domestic markets. This is what I mean when I say that cotton utilization in this country is more important to the South than any probable outcome of the European war.

Now what is involved in increasing the utilization of cotton? Well, we can't bring this about by wishful thinking, and we have no Aladdin's lamp that we can rub. I'm not trying to be facetious, I am serious. The only way by which cotton utilization can be increased is by positive and intensive efforts directed specifically toward that end; that is, by conducting research and investigations aimed specifically at increasing the consumption of cotton.

Perhaps a pertinent question at this point would be, can domestic cotton consumption be increased by any method? In my opinion the answer is "yes," and my answer is not based solely on faith in the effectiveness of the research method, although there is necessarily a large element of faith involved where research is concerned.

To get a clearer picture of the possibilities of increasing the domestic utilization of cotton, let's examine the field of cotton utilization itself. Let's see just what our problem consists of. What are the forces and conditions with which we have to contend? We cannot solve a problem effectively, if at all, unless we know precisely what the problem is.

Cotton utilization in the United States is a tremendously complex field. There are literally hundreds of separate and distinct uses and the quantities of cotton going into each of them are affected by a multitude of different factors. But in spite of this great complexity, we can group them into a few divisions which have several general characteristics in common.

For example, we know that about 40 percent of the cotton consumed in this country goes into what we call "industrial" uses; that is, uses like automobile tire fabrics, bags, twine and cordage, belting, and so on. In most industrial uses, the durability of a fabric under moderate to severe treatment is a matter of prime importance in its selection. Another equally important consideration is the relative price of competing materials. Cotton meets both of these requirements admirably, but within recent years, jute and paper - especially paper - have been cutting steadily into many industrial uses once entirely supplied by cotton. An example was given a moment ago in the case of bags for shipping cement. The principal advantage of paper and jute in industrial uses is their cheapness in relation to cotton.

Then we have one or two instances of higher-priced fibers competing with cotton in an industrial use. For example, some rayon is now being used in the manufacture of automobile tires. And this brings to mind the statement made a moment ago that I would give you a concrete example of what technological and scientific research can accomplish in the way of aiding cotton with its competitors. I do not want to digress too far afield, but I believe you will find something of interest in this example.

Modern cord-tire fabric is itself a true product of research. It is fascinating to trace its gradual evolution from the types used in the old high-pressure casings into the types now used in our durable, high-speed balloon tires, but time does not permit. More recently, we have had an example of research in the field of tire fabrics which should caution us against ever writing "finis" on the development of any product, no matter how satisfactory it may seem. With huge trucks lumbering over the country at 50 miles an hour on mammoth tires containing nearly a bale of cotton in the form of fabric, and with these tires performing in a way in which no one ever dreamed tires could ever be made to perform, it seemed that little was left to be desired in the way of further improvement. But there suddenly appeared in this field the fruits of intensive research on another type of fiber, rayon. In 1937, a truck tire with cord fabric made from rayon, instead of cotton, was placed on the market. Though more expensive, this rayon-cord tire was reported to be more durable than existing cotton-cord tires under extra-heavy loads in sustained high-speed service. About a year later, rayon-cord tires designed for the extra-quality passenger car tire field were announced.

This looked very much like the beginning of a trend of great danger to cotton, for about 8 percent of all the domestically consumed cotton each year goes into tire fabrics. But manufacturers of cotton-cord fabric got busy and the results of their efforts are distinctly encouraging to producers and processors of cotton. A little over a year ago a new type of cotton-cord fabric, the result of research, was placed on the market and its makers claim that it outperforms any other type of fabric.

The extent to which rayon may finally replace cotton in this field is still highly uncertain, but these recent improvements in the design of cotton tire-cords have undoubtedly narrowed the field potentially open to rayon, and definitely prove that research <u>can</u> be effective in maintaining the consumption of cotton.

There are other examples that might be mentioned which illustrate the opportunities for research to increase the consumption of cotton in industrial uses. The Department of Agriculture, with limited funds has itself experienced some success along these lines, but I believe the foregoing example is sufficient to illustrate the point.

In clothing and household fabrics, which represent about 40 percent and 20 percent of our domestic consumption, respectively, the factors of competition are somewhat different. In many of these uses, appearance, along with a certain required minimum of durability, is the competitive factor of greatest importance. During the last few years, there has been a gradually increasing substitution of rayon for cotton in certain clothing and household fabrics. This has come about principally because of a greater sales appeal possessed by these rayon fabrics, for in many instances the cotton fabrics displaced were cheaper and more durable.

To a considerable extent fabrics made from synthetic fibers depend upon new chemical processes for their style and sales appeal. This fact is significant, for it points the way to the main type of research needed on cotton to maintain and extend its use in clothing and household fabrics. But I shall not go into details regarding this type of research. Dr. Scott, who addresses you later, will discuss needed research on chemical finishes for cotton fabrics.

This just about completes the picture I want to bring to you. It has been all too sketchy, but the main outline is there. Your attention has been called again to what the cotton industry -- from the growing of cotton on through to its manufacture -- means to the economy of the South. Your special attention has been called to the fact that our domestic market is becoming of ever increasing importance, and that it is conditions obtaining in the field of cotton utilization which, in the final analysis, determine how much of our crop can be sold at favorable prices. The conclusion was drawn that if production of cotton in the United States is to be maintained at anywhere near the levels which obtained during the 1920's, or even at those of the last 5 or 6 years, increased outlets must be found in domestic markets.

The natural expansion period of cotton consumption in this country has ended, and the only way by which cotton utilization can be increased is by positive efforts directed specifically toward that end; that is, by conducting research and investigations aimed specifically at increasing the utilization of cotton. Further, the time has come when intensive work of this nature must be done, and must be begun without delay, if domestic markets for American cotton are to be expanded, or even maintained at present levels.

And now, just one final point. Our Federal Government has not been blind to these facts. As you know, Congress has appropriated money for the construction and operation of 4 regional research laboratories, and these laboratories have been charged with the task of finding new and wider outlets and markets for surplus farm commodities. The one for the Southern region, now under construction in New Orleans, Louisiana, will work on cotton, peanuts, and sweet potatoes, with major attention on cotton. The research on cotton lint will be concerned with problems of precisely the nature that I have just outlined, and will be organized into three separate divisions, namely, the Division of Fundamental Cotton Fiber Investigations; the Cotton Processing Division; and the

Cotton Chemical Finishing Division. There will also be research on cottonseed and its various byproducts.

Research on the chemical and physical structure of cotton fiber, and on those inherent properties which govern the utility of cotton, will be conducted in the Division of Fundamental Cotton Fiber Investigations. The importance of research of this nature is worth stressing because it is the function of fundamental research to supply a steady stream of scientific facts upon which applied research is based. The research on chemical finishes for cotton fabrics will, of course, be conducted in the Cotton Chemical Finishing Division. As mentioned a moment ago, Dr. Scott will tell you about this work. Research in which primary emphasis will be placed on finding new and extended industrial uses for cotton will be conducted in the Cotton Processing Division, although some work will also be done in this division on clothing and household fabrics. This is the Division with which I shall be associated, and I should like to tell you very briefly what our aims are and by what means we hope to accomplish them.

The work of the Cotton Processing Division will be organized into three separate but closely cooperating sections. First, there will be a Survey and Appraisal Section. It will collect, analyze, and interpret various types of technical and economic data which will be needed in connection with the research of the other two sections. Such information will be of great value in selecting the most worth-while projects on which to work, will provide many clues to directions along which new research might profitably be undertaken, and will be of aid in evaluating the industrial possibilities of the products of research as they are developed. I could give you numerous examples of the importance of this type of work, and of the benefits to be derived from having it as an integral part of the research program, but time does not permit.

The Fabric Development Section will, as you might surmise, work on the development of new and improved cotton yarns and fabrics for specific purposes. Research procedure for such work is quite straightforward. Through economic and technological surveys, or through suggestions received from various sources, attention is focused upon some specific potential use, like cotton bagging for cotton, or on a fabric to prevent soil erosion in highway construction. The physical properties and cost requirements of the use are carefully studied and then the technical knowledge of the research staff is applied to design and produce a cotton fabric to meet both the physical and cost requirements, if this is possible. An important point to bring out here is that we study particularly the requirements of the use itself, and only for the purpose of comparison do we study the properties and cost of the product currently being used--if there is one. The significance of this is that it does not always follow that the unprocessed textile fiber that is cheapest makes the most satisfactory product. For example, jute sells for about half as much as cotton; and yet we have recently found a satisfactory cotton twine for tying mail which, on a yardage basis, is in the competitive price range of jute.

A third section will work on the development of new and improved cotton processing machinery and methods of manufacture, with the purpose of lowering manufacturing costs and improving the quality of cotton products. In most industrial uses, like bags for example, manufacturing costs of the fabric amount to more than a third of the cost of the finished product. Price competition is

keen in most industrial uses and we know that reduction of manufacturing costs by a few cents per pound can mean a considerable shifting over to cotton from a competing product like jute or paper.

Finally, the new cotton fabrics and other products of research will be given appropriate tests to determine their commercial practicability, and the information obtained therefrom made available to those who will use it.

These are the methods and types of research which will be followed in the Cotton Processing Division. Together with the research of the other Divisions of the Southern Regional Laboratory they will form part of a comprehensive, concerted, closely-knit program of research--scientific, technological, and economic--all carried on with the specific aim of finding new and wider uses for cotton.

Research is a method which should be more and more productive of worthwhile results with the passing of each year. In the case of cotton such a program is long overdue. This will be the first time that the Federal Government has ever gone into research on utilization of cotton and its byproducts in such a thorough and aggressive manner. Congress has appropriated money for this research program which will provide personnel, equipment, and funds commensurate with the importance and urgency of the problem of finding new and extended outlets for cotton and its byproducts. But it is up to us - all of us - to make the program pay. We know the problems confronting the cotton industry of the United States; we know the opportunities afforded by research; and we know how important it is that we bend every effort toward increasing the utilization of American Cotton.